

Canada



Name: Tunnelling Association of Canada (TAC)

Type of Structure: Federally incorporated not-for-profit society

Number of Members (2021): 386 (266 full, 68 corporate, 15 retired, 37 student)

ASSOCIATION ACTIVITIES DURING 2021 AND TO DATE

The COVID-19 pandemic curtailed the ability to hold in-person meetings for most of the year, so TAC's Ontario and BC Chapters and Young Members Group continued to offer online webinars. These included:

- **01/28/2021** – Risk and Risk Management in Underground Projects
- **02/25/2021** – Current and Future Tunnel Projects in Ontario
- **03/04/2021** – 2020 TAC Undergraduate & Dan Eisenstein Memorial Scholarship Presentations
- **04/29/2021** – Ashbridges Bay Treatment Plant Outfall Tunnel Update
- **05/27/2021** – Rockmass Technologies – Axis Mapper
- **06/17/2021** – Eglinton Crosstown LRT
- **07/22/2021** – Twinning of the West Trunk Sewer
- **08/12/2021** – Emerging Safety Technologies for North American Tunnelling
- **09/22/2021** – Grouting Comparison of Two Segmentally Lined Rock Tunnels
- **11/18/2021** – Site C Clean Energy Project Underground Works

TAC was able to hold its postponed 2020 conference in October 2021. Over 350 tunnelling professionals and guests, 29 sponsors and 33 exhibitors met October 19-21 in Toronto, Ontario under the theme Vision Underground for TAC's most successful conference ever. Keynotes and sessions included:

- Global Tunnelling Update and ITA (Canada)'s Role: Today and Tomorrow
- Canadian Tunnelling – What Can the Mining Industry Bring to The Table?
- Transit Development and Expansion Growing Below the Ground
- 2020 and 2021 Canadian Project of the Year Presentations
- Current & Future Canadian Projects
- Transit Tunnels: Design & Construction
- TBM Tunnelling
- Case Histories and Challenging Projects
- SEM and Caverns

- Future Projects & Costing
- Research and Innovation
- Trenchless and Rehabilitation
- Safety and Risk Management



The conference featured the return of TAC's annual Achievement Awards Dinner.

The 2021 award recipients included:

- Lifetime Achievement Award – Frank Policicchio
- Young Tunneller of the Year Award – Michael Mains
- Canadian Innovation Initiative Award – Robbins, Hatch, Southland Holdings, Astaldi and the City of Toronto for the "Ashbridges Bay Treatment Plant Outfall Tunnel Project"
- Canadian Project of the Year (Up to \$100M CAD) – AECOM, Volker Stevin, Innovative Pipeline Crossings and the City of Calgary for the "Rangeview Sanitary Trunk Phase 1 Project"
- Canadian Project of the Year (Over \$100M CAD) – Hatch, Technicore and the Region of Peel for the "Burnhamthorpe Water Project, Contract 1/2"
- Photo of the Year Award – Hatch for "Kemano T2 Project TBM Cutterhead Inspection"
- TAC Outstanding Service Award – Steve Skelhorn

- Dan Eisenstein Memorial Scholarship – Simone Markus
- TAC Undergraduate Scholarship – Claire Thurston

Full 2021 TAC Achievement Award details and videos are posted on the TAC website at https://www.tunnelcanada.ca/awards_2021.php.

The 2021 conference also featured the release of TAC's new commemorative book Canadian Tunnelling: Memories and Achievements, which showcases prominent Canadian tunnelling projects undertaken since the founding of Canada. The book charts the progress of Canada's tunnelling industry and includes high quality photos in large format that capture both historical and recent tunnelling projects. This six-year project undertaken by TAC Directors will be a valuable means to promote the tunnelling industry to educators, government, and industry decision makers, as well as the public at large.

2021 also saw the launch of TAC's semi-annual magazine Canadian Tunnelling, issued in conjunction with Tunnelling Journal as part of its February and September issues. Content for the periodical (see <https://tunnellingjournal.com/archive/tunnelling-journal-september-2021/>) is generated primarily by TAC Directors and features industry news, TAC news and feature articles from across Canada.

The brief window of relaxed COVID-19 in-person event regulations in the fall enabled TAC's Ontario Chapter to run its St. Barbara's Day year-end social on December 2 that saw 100 members attend.

CANADIAN TUNNELLING ACTIVITIES

Key Western Canada projects currently under construction or completed in 2021 include:

- North Shore Wastewater Conveyance (North Vancouver, BC): 520m intake tunnel.
- Second Narrows Water Supply Tunnel (Vancouver, BC): 5.4m diameter, 1.2km long TBM excavated water conveyance tunnel.
- Annacis Island Wastewater Treatment Plant Outfall (Vancouver, BC): 1.2km long TBM excavated tunnel between two 40m deep shafts.
- Broadway Subway Project (Vancouver, BC): 6km TBM bored subway extension to the existing Millennium Line Skytrain with 6 new stations.
- Trans Mountain Pipeline Burnaby

Mountain Tunnel (Burnaby, BC): 2.6 km long, 4m diameter TBM tunnel to relocate existing 24-inch delivery pipeline and replace with three 30-inch pipelines.

- Valley Line LRT (Edmonton, AB): 27km LRT extension includes construction of two 500m long soft ground NATM tunnels.
- Duggan Tunnel Replacement (Edmonton, AB): 3km of 2.1m diameter truck sewer with 18 shafts and open cut work.
- Inglewood Sanitary Trunk Project (Calgary, AB): 2.4m diameter, 4km microtunnelling project.
- Combined Sewer Overflow Relief Project (Winnipeg, MB): Multiple ongoing projects.

Examples of key Eastern Canada projects currently in progress or completed in 2021 include:

- Hwy 401 Rail Tunnel (Greater Toronto and Hamilton Area, ON): Two tunnels excavated less than 3m underneath two busy highways.
- Coxwell Bypass (Toronto, ON): 6.3m diameter and 10.5km long TBM-excavated tunnel.
- Ashbridges Bay Outfall (Toronto, ON): 7m diameter, 3.5km long TBM-excavated outfall tunnel underneath Lake Ontario.
- Scarborough Subway Extension (Toronto, ON): 10.7m single bore 8km tunnel with three stations and eight emergency exit buildings.
- Metrolinx Stations (Toronto, ON): Various Projects
- Ontario Line (formerly Downtown Relief Line, Toronto, ON): Advance works have commenced. 16km of 6m diameter TBM tunnels with eight new underground stations.
- East to West Diversion Tunnel (Peel Region, ON): 11km, 2.4m earth-pressure balance TBM



Annacis Outfall Tunnel

- Ottawa LRT Stage 2 (Ottawa, ON)
- Bassin Lavigne (Montréal, QC): 1.9km of tunnelling to provide supply and connecting tunnels to a 42m diameter, 25m deep retention basin for reducing wastewater overflow.
- Lafontaine Tunnel (Montréal, QC): Renovation of the 53-year-old, 1.5km long, double tube immersed, Louis-Hippolyte-Lafontaine tunnel.
- Réseau Électrique Métropolitain, REM (Montréal, QC): Two major tunnels including a 3km long TBM excavated tunnel to be driven underneath the Montreal Airport runways.
- Blue Line Extension (Montréal, QC): 5.8km of tunnel with five stations

- Côte Vertu Storage/Maintenance Facility (Montréal, QC): 3 tunnels totalling 1.5km in length

FUTURE MAJOR CANADIAN TUNNELLING PROJECTS (PLANNED OR PROSPECTIVE)

A sampling of planned projects across Canada includes:

- Stanley Park Water Supply (Vancouver, BC): 1.4km long, 4m diameter, SEM tunnel in rock, with shafts in excess of 30m deep.
- Coquitlam No 4 Watermain (Coquitlam, BC): 2km long, 5m diameter, TBM tunnel in soil, with access shafts in excess of 40m deep.
- Annacis Water Supply Tunnel (New Westminster, BC): 2.3km long, 3.8m EPB single pipe tunnel.
- Cambie Richmond Water Supply Tunnel (Vancouver and Richmond, BC):
- Fortis BC Eagle Mountain (Squamish, BC): 9km long, 4m diameter TBM tunnel, driven in both rock and soil, with dedicated hard rock and soft ground TBMs.
- Green Line LRT (Calgary, AB): 46km extension to the existing LRT includes over 3km of tunnel in the City's downtown area.
- Eglinton Crosstown (West) Phase 2 (Toronto, ON): 9.2km LRT extension, predominantly tunnelled

Prospective Canadian projects include:

- Coquitlam Second Intake Project (British Columbia)
- Yonge Street Subway Extension (Greater Toronto Area, Ontario)
- Inner Harbour West Tunnel (Ontario)
- Taylor Massey Creek (Ontario)
- Québec-Lévis Tunnel (Quebec)
- Halifax Red Line Tunnel (Nova Scotia)
- Newfoundland to Labrador Crossing (Newfoundland)